

# Course Material

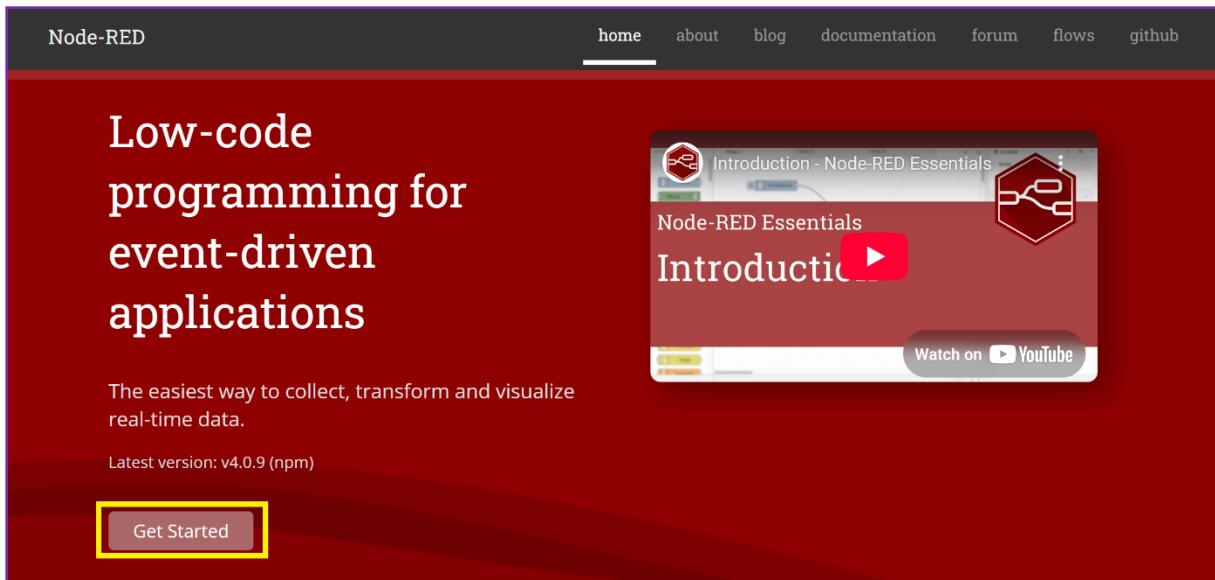
## Node-RED

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Node-RED – User Guide .....	3
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### Installation

1. Go to <https://nodered.org/>
2. Click on "Get Started → Run locally → Getting started → Running locally".



Node-RED

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Low-code programming for event-driven applications

The easiest way to collect, transform and visualize real-time data.

Latest version: v4.0.9 (npm)

Get Started

Introduction - Node-RED Essentials

Node-RED Essentials

Introduction

Watch on YouTube

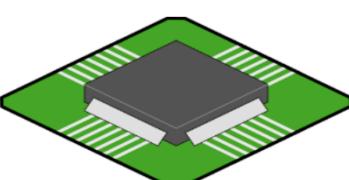
**Get Started**

Node-RED is built on Node.js, taking full advantage of its event-driven, non-blocking model. This makes it ideal to run at the edge of the network on low-cost hardware such as the Raspberry Pi as well as in the cloud.



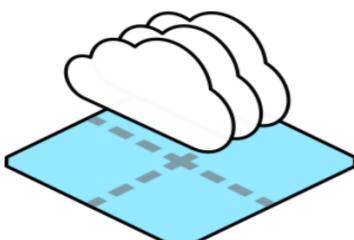
Run locally

- Getting started
- Docker



On a device

- Raspberry Pi
- BeagleBone Black



In the cloud

- FlowFuse
- Amazon Web Services

Node-RED

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## Getting Started

This guide will help you get Node-RED installed and running in just a few minutes.

Pick where you want to run Node-RED, whether on your local computer, a device such as a Raspberry Pi or in the cloud and follow the guides below.



### Running locally

Installing Node-RED on your local computer



### Raspberry Pi

Get started using our all-in-one install script for the mighty Raspberry Pi



### Docker

Running Node-RED using Docker

3. For Windows installation, click on the highlighted link and follow the steps to install Node.js.

<https://nodered.org/docs/getting-started/windows>

Node-RED

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Prerequisites

- Installing with npm
- Installing with docker
- Installing with snap
- Running
- Command-line Usage
- Override individual settings
- Passing arguments to the underlying Node.js process
- Upgrading Node-RED
- Next steps

## Running Node-RED locally

 If you are on a Raspberry Pi or any Debian-based operating system, including Ubuntu and Diet-Pi, you can use the Pi install script available [here](#).

 If you are on an RPM-based operating system, including RedHat, Fedora and CentOS, you can use the RPM install script available [here](#).

 If you are using Windows, detailed instructions for installing Node-RED can be found [here](#).

Prerequisites

To install Node-RED locally you will need a [supported version of Node.js](#).

4. First, install [Node.js](#) and then proceed with the steps in the given order.

Node.js launches an official Discord community [↗](#)

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Q Start typing... Ctrl + K

[Create an HTTP Server](#) [Write Tests](#) [Read and Hash a File](#) [Stream Data](#)

# Run JavaScript Everywhere

Node.js® is a free, open-source, cross-platform JavaScript runtime environment that lets developers create servers, web apps, command line tools and scripts.

[Download Node.js \(LTS\) !\[\]\(90b72a2399b1982a0f0b7a8676dcfc8d\_img.jpg\)](#)

Downloads Node.js v22.14.0<sup>1</sup> with long-term support.  
Node.js can also be installed via version managers.

Want new features sooner? Get Node.js v22.14.0 [→](#) instead.

```

1 // server.mjs
2 import { createServer } from 'node:http';
3
4 const server = createServer((req, res) => {
5   res.writeHead(200, { 'Content-Type': 'text/plain' });
6   res.end('Hello World!\n');
7 });
8
9 // starts a simple http server locally on port 3000
10 server.listen(3000, '127.0.0.1', () => {
11   console.log('Listening on 127.0.0.1:3000');
12 });
13
14 // run with 'node server.mjs'

```

JavaScript [Copy to clipboard](#)

## Quick Start

### 1. Install Node.js

Download the latest LTS version of Node.js from the official [Node.js home page](#). It will offer you the best version for your system.

Run the downloaded MSI file. Installing Node.js requires local administrator rights; if you are not a local administrator, you will be prompted for an administrator password on install. Accept the defaults when installing. After installation completes, close any open command prompts and re-open to ensure new environment variables are picked up.

Once installed, open a command prompt and run the following command to ensure Node.js and npm are installed correctly.

Using Powershell: `node --version; npm --version`

Using cmd: `node --version && npm --version`

You should receive back output that looks similar to:

```
v18.15.0
9.5.0
```

### 2. Install Node-RED

Installing Node-RED as a global module adds the command `node-red` to your system path. Execute the following at the command prompt:

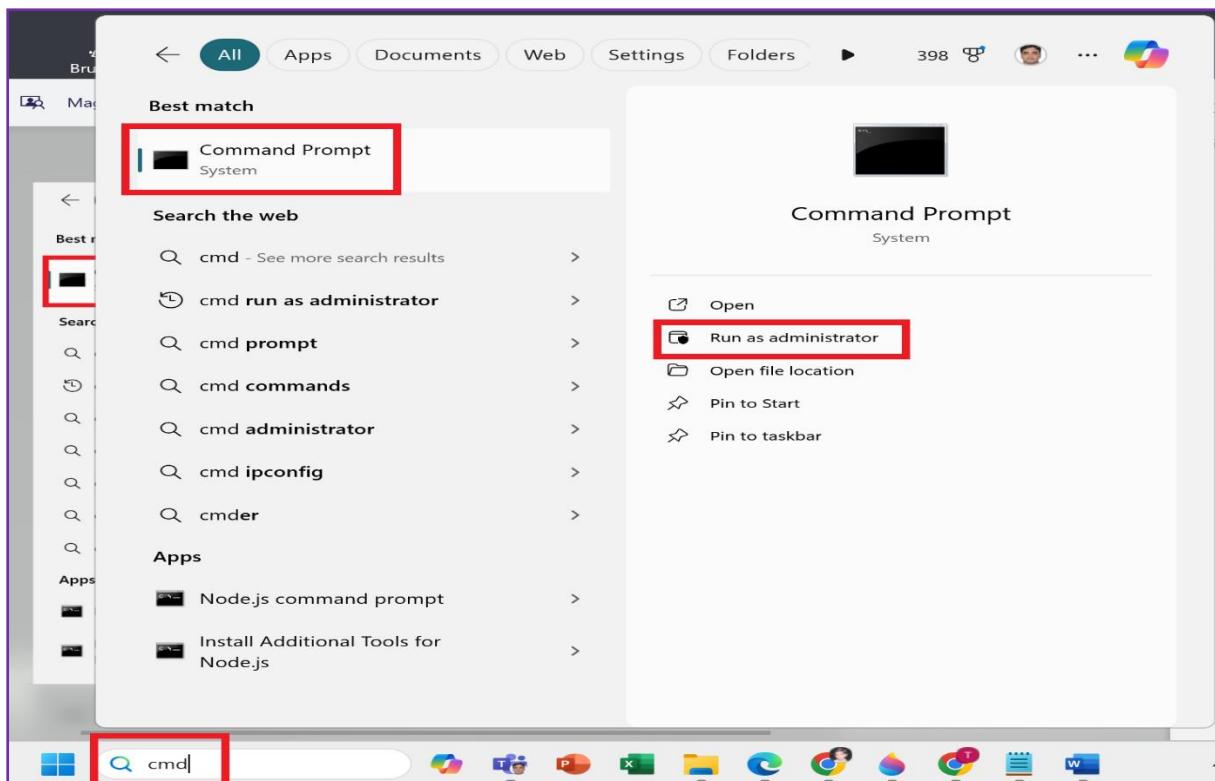
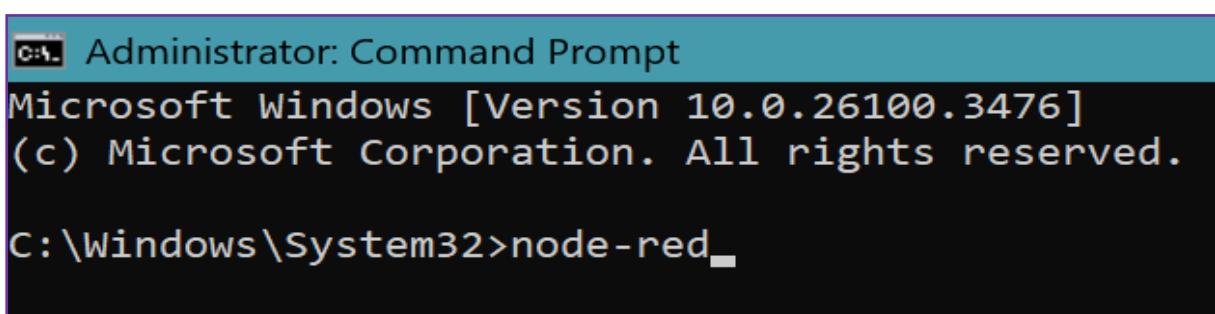
```
npm install -g --unsafe-perm node-red
```

### 3. Run Node-RED

Once installed, you are ready to [run Node-RED](#).

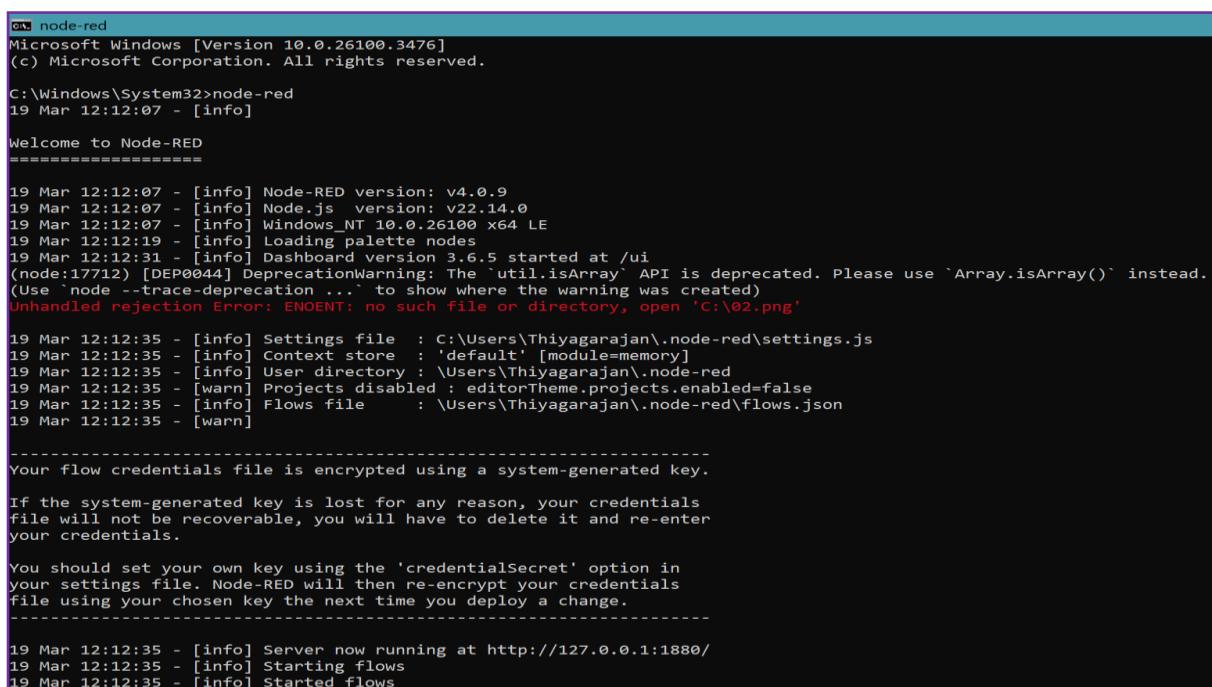
## Node-RED – User Guide

1. Open the Command Prompt on your PC by typing “**cmd**” in the search bar and selecting “**Run as administrator**”. Inside the Command Prompt, type “**node-red**” and press **Enter** to run Node.js.

Administrator: Command Prompt  
 Microsoft Windows [Version 10.0.26100.3476]  
 (c) Microsoft Corporation. All rights reserved.

```
C:\Windows\System32>node-red
```



```
node-red
Microsoft Windows [Version 10.0.26100.3476]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>node-red
19 Mar 12:12:07 - [info] Node-RED version: v4.0.9
19 Mar 12:12:07 - [info] Node.js version: v22.14.0
19 Mar 12:12:07 - [info] Windows_NT 10.0.26100 x64 LE
19 Mar 12:12:19 - [info] Loading palette nodes
19 Mar 12:12:31 - [info] Dashboard version 3.6.5 started at /ui
(node:17712) [DEP0044] DeprecationWarning: The `util.isArray` API is deprecated. Please use `Array.isArray()` instead.
(Use `node --trace-deprecation ...` to show where the warning was created)
Uncaught rejection Error: ENOENT: no such file or directory, open 'C:\02.png'

19 Mar 12:12:35 - [info] Settings file : C:\Users\Thiyagarajan\.node-red\settings.json
19 Mar 12:12:35 - [info] Context store : 'default' [module=memory]
19 Mar 12:12:35 - [info] User directory : \Users\Thiyagarajan\.node-red
19 Mar 12:12:35 - [warn] Projects disabled : editorTheme.projects.enabled=false
19 Mar 12:12:35 - [info] Flows file : \Users\Thiyagarajan\.node-red\flows.json
19 Mar 12:12:35 - [warn]

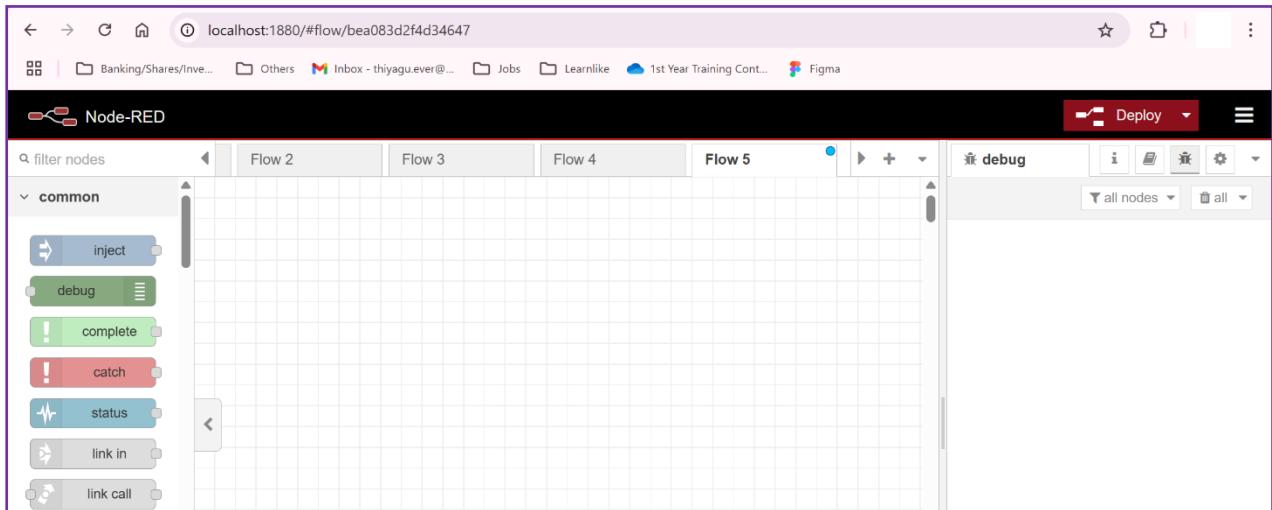
-----
Your flow credentials file is encrypted using a system-generated key.

If the system-generated key is lost for any reason, your credentials file will not be recoverable, you will have to delete it and re-enter your credentials.

You should set your own key using the 'credentialSecret' option in your settings file. Node-RED will then re-encrypt your credentials file using your chosen key the next time you deploy a change.
-----

19 Mar 12:12:35 - [info] Server now running at http://127.0.0.1:1880/
19 Mar 12:12:35 - [info] Starting flows
19 Mar 12:12:35 - [info] Started flows
```

- After initializing Node-RED, open any browser and enter <http://localhost:1880> in the address bar to launch Node-RED in the browser.

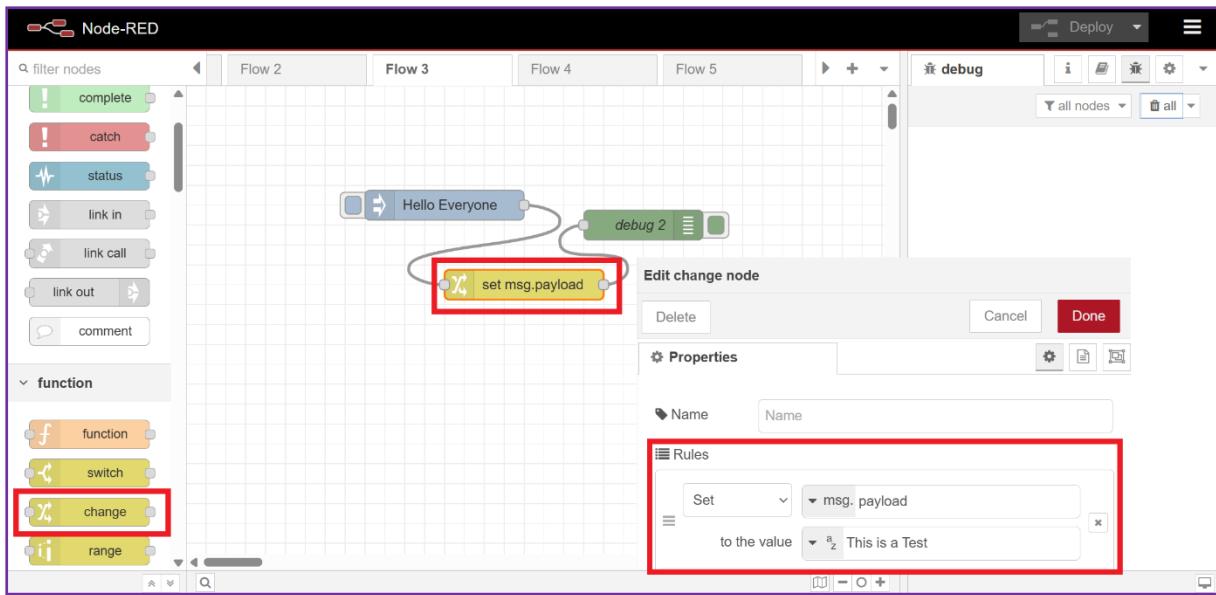


- Follow this Node-RED YouTube tutorial to create your first flow and understand its functionality.

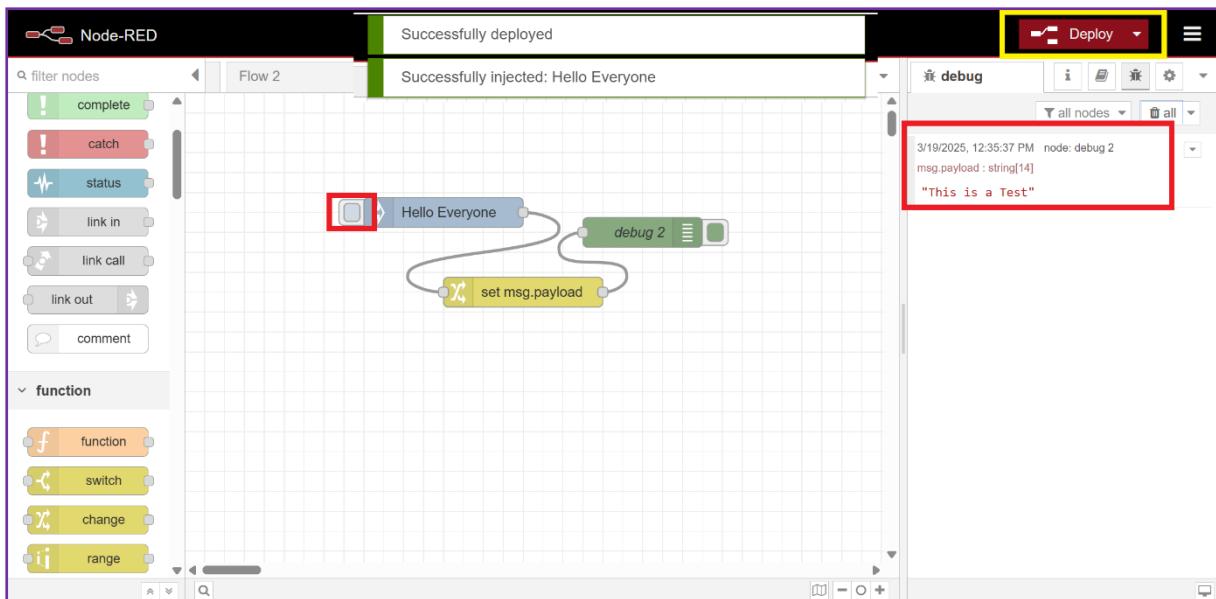


**Note:** Always keep the command prompt open to run Node.js. If closed Node-RED will stop working.

- Scroll down and add the “change” function to modify the **msg.payload** input to a new value.

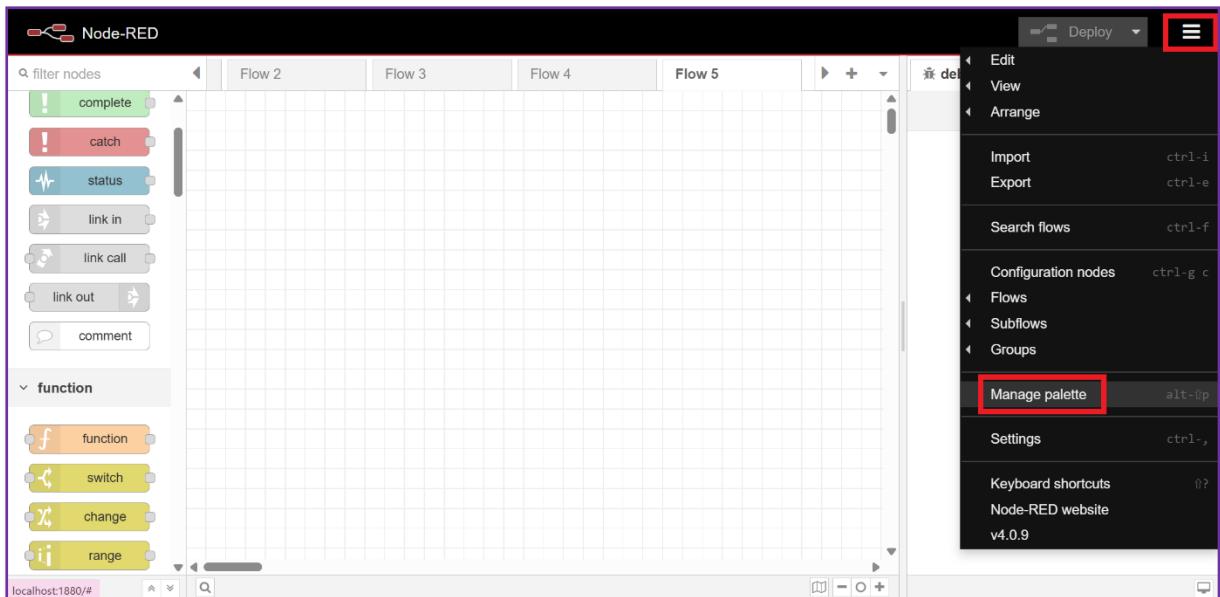


5. Click on “Deploy”, then click on “Inject” to see the changes in action.

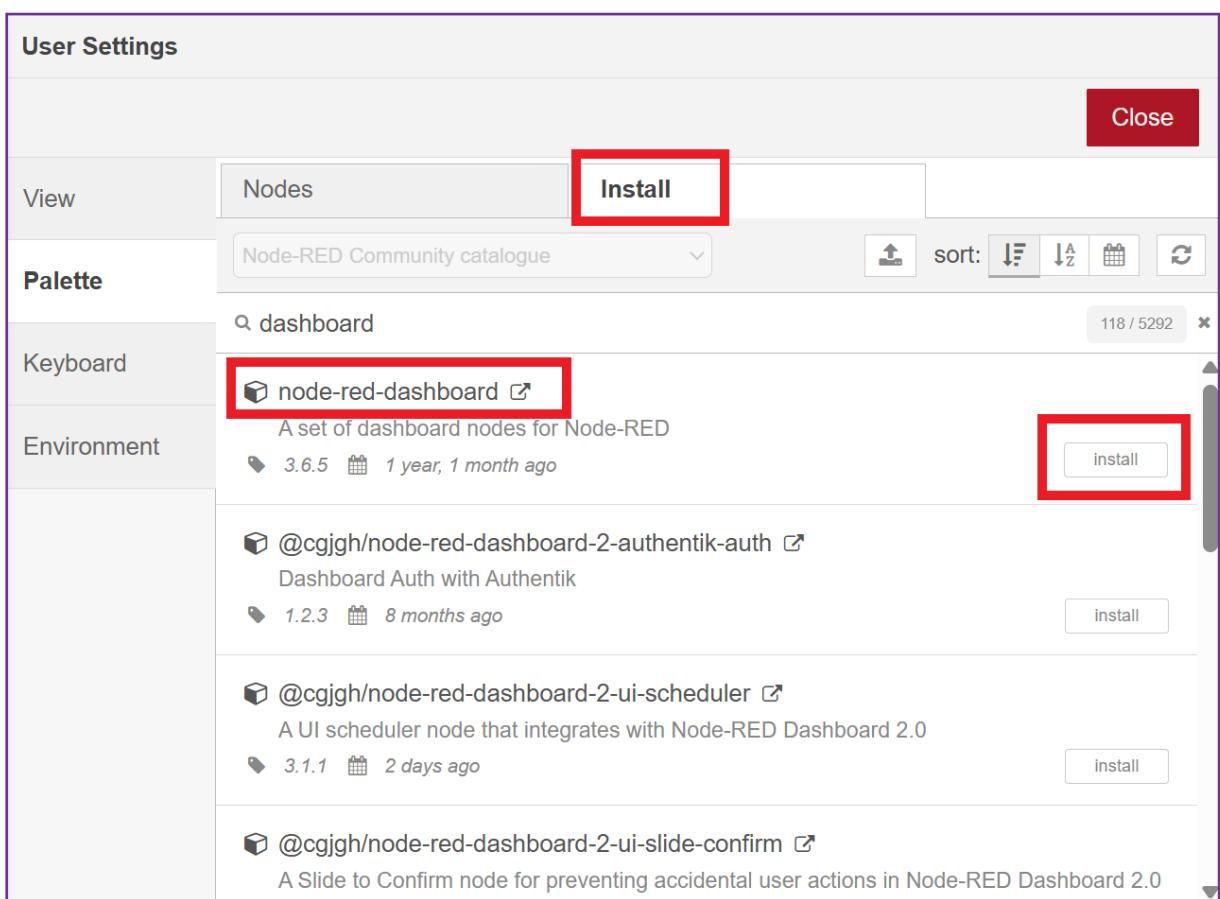


## Node-RED – Dashboard

1. Click on the **Hamburger menu** ( $\equiv$ ) in the top right corner and select **Manage palette**.

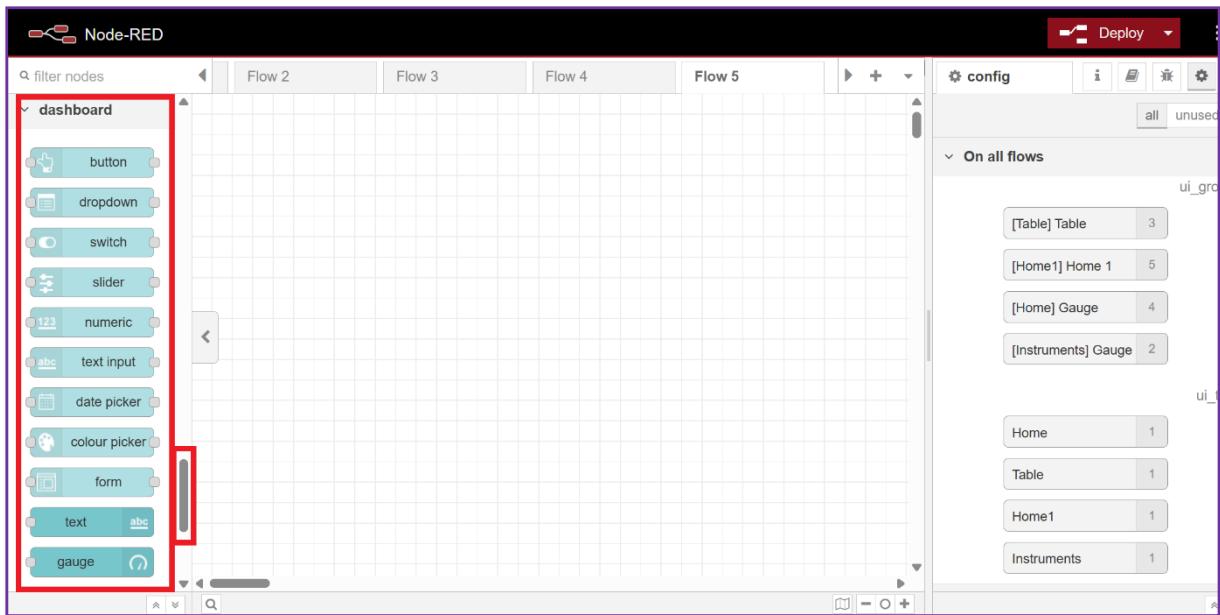


2. Go to the “Install” tab, search for **dashboard**, select “node-red-dashboard”, and click “Install” to add the node.

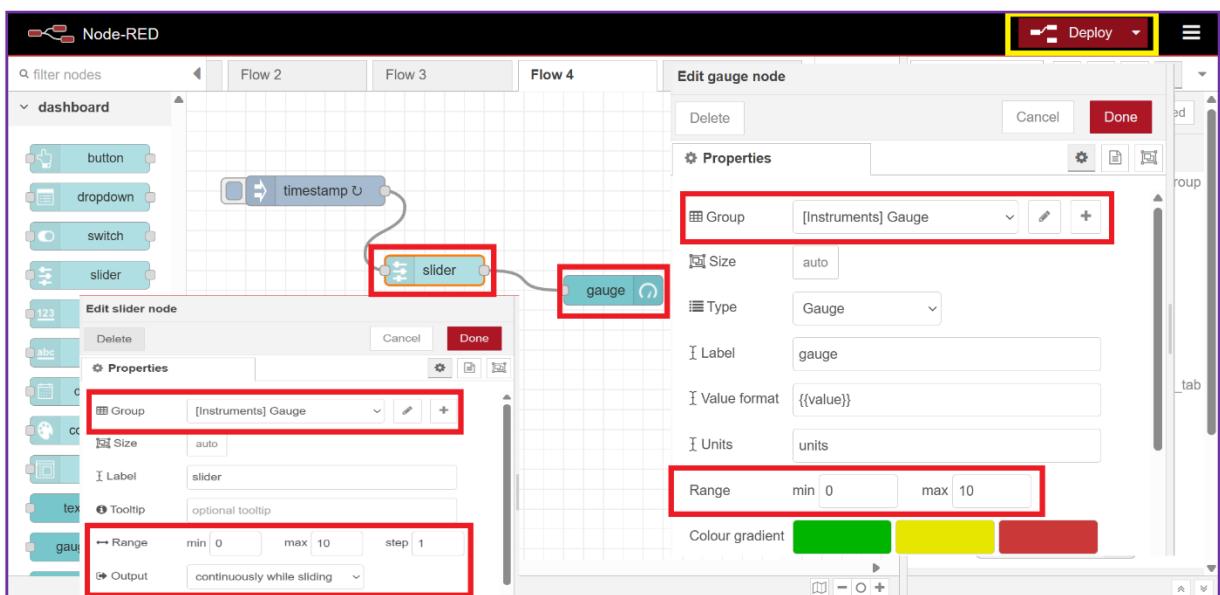


A screenshot of the Node-RED User Settings 'Install' tab. The 'Nodes' tab is selected. A search bar at the top right contains the text 'dashboard'. Below it, a list of packages is shown, with the first item, 'node-red-dashboard', highlighted with a red box. This item has a description 'A set of dashboard nodes for Node-RED', a version '3.6.5', and a timestamp '1 year, 1 month ago'. To the right of this item is another red box around the 'install' button. Other items in the list include '@cgjgh/node-red-dashboard-2-authentik-auth', '@cgjgh/node-red-dashboard-2-ui-scheduler', and '@cgjgh/node-red-dashboard-2-ui-slide-confirm'.

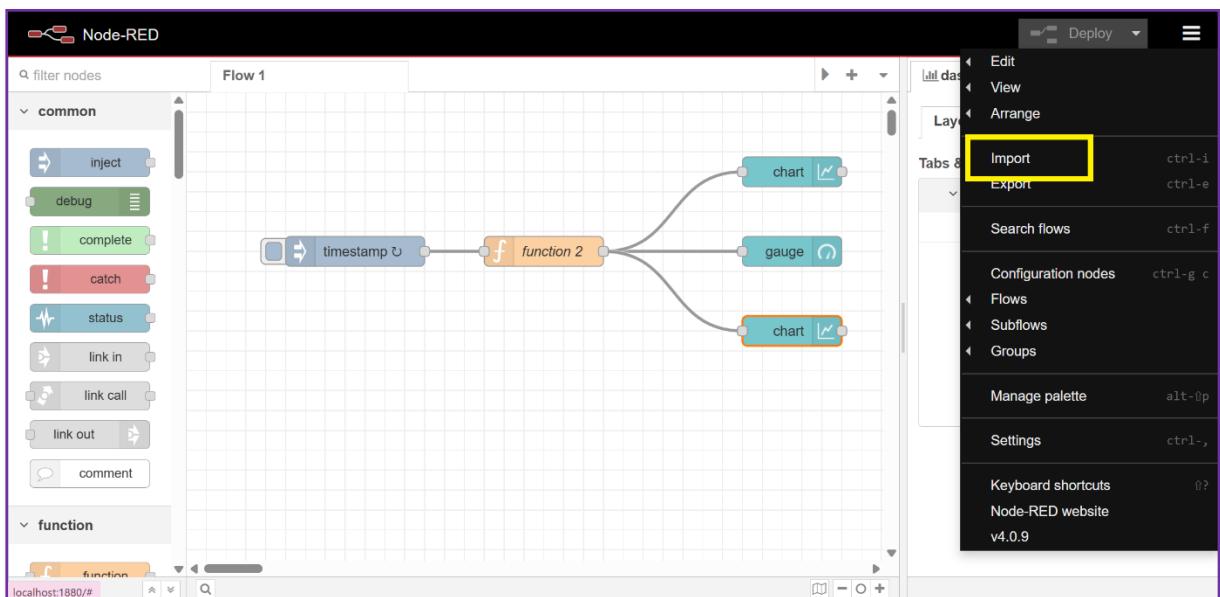
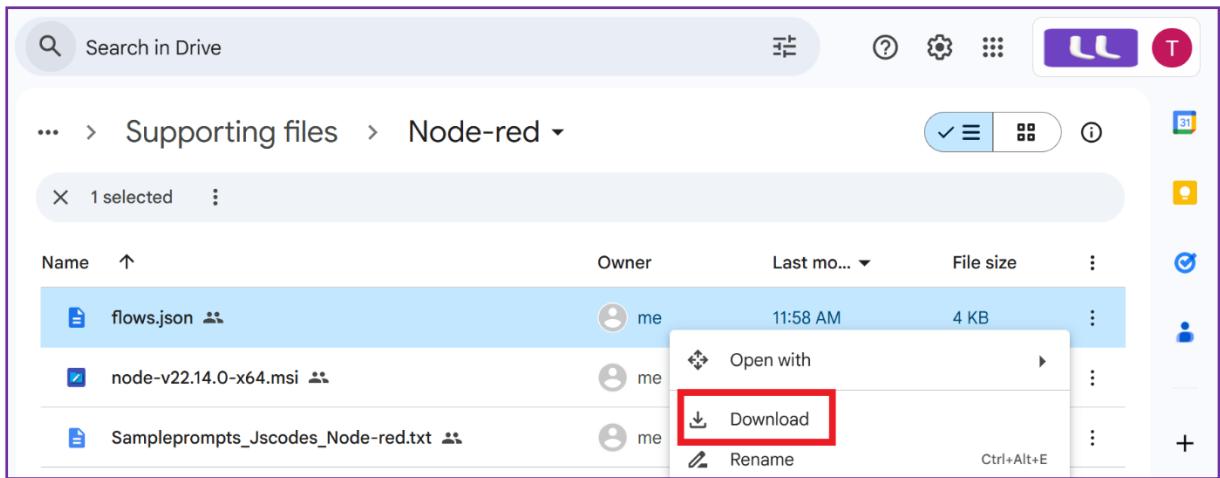
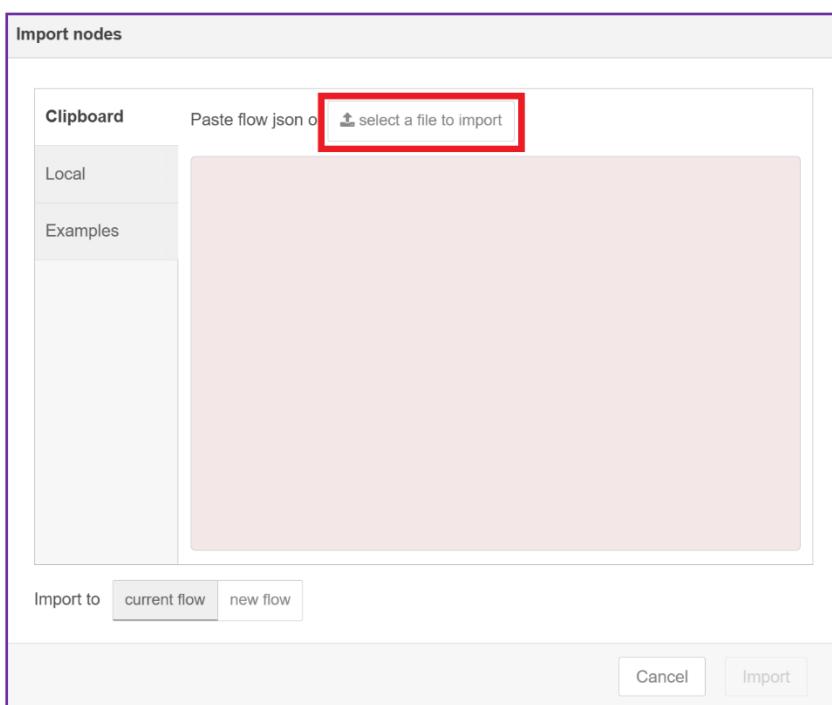
3. Scroll down the left navigation menu to view the dashboard nodes that have been added to your Node-RED workspace, allowing you to create UI components for your flows.



- Follow this simple dashboard setup to connect a slider with a gauge. To access the UI in your browser, type <http://localhost:1880/ui>.



- Download the [flows.json](#) file from Google Drive. In Node-RED, click on the hamburger menu and select **Import**. Choose the [flows.json](#) file from your local computer and click **Open** to add the flow. Finally, click **Deploy** to activate the flow.

Import nodes

Clipboard

Paste flow json or

Local

Examples

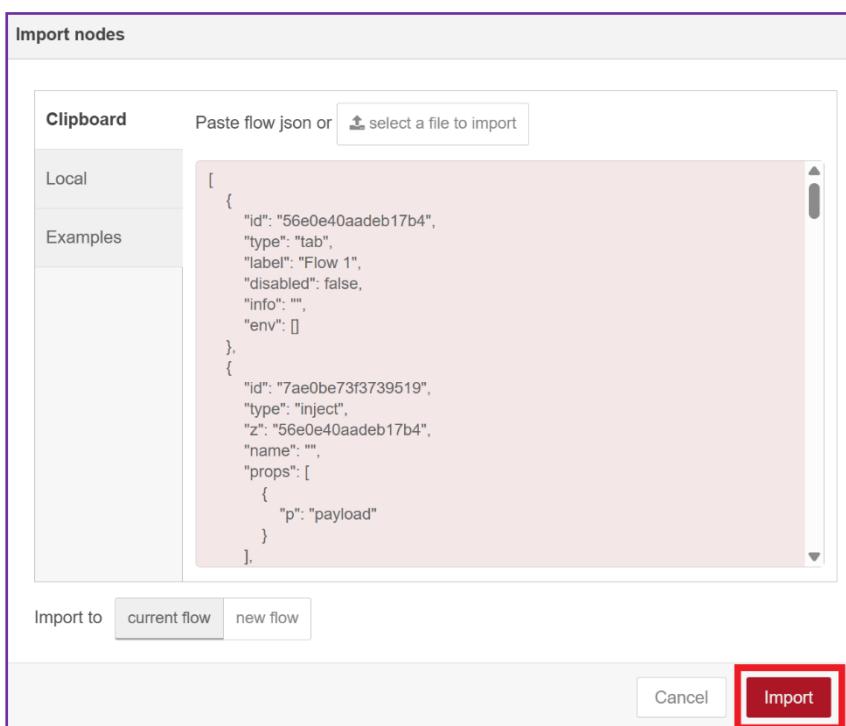
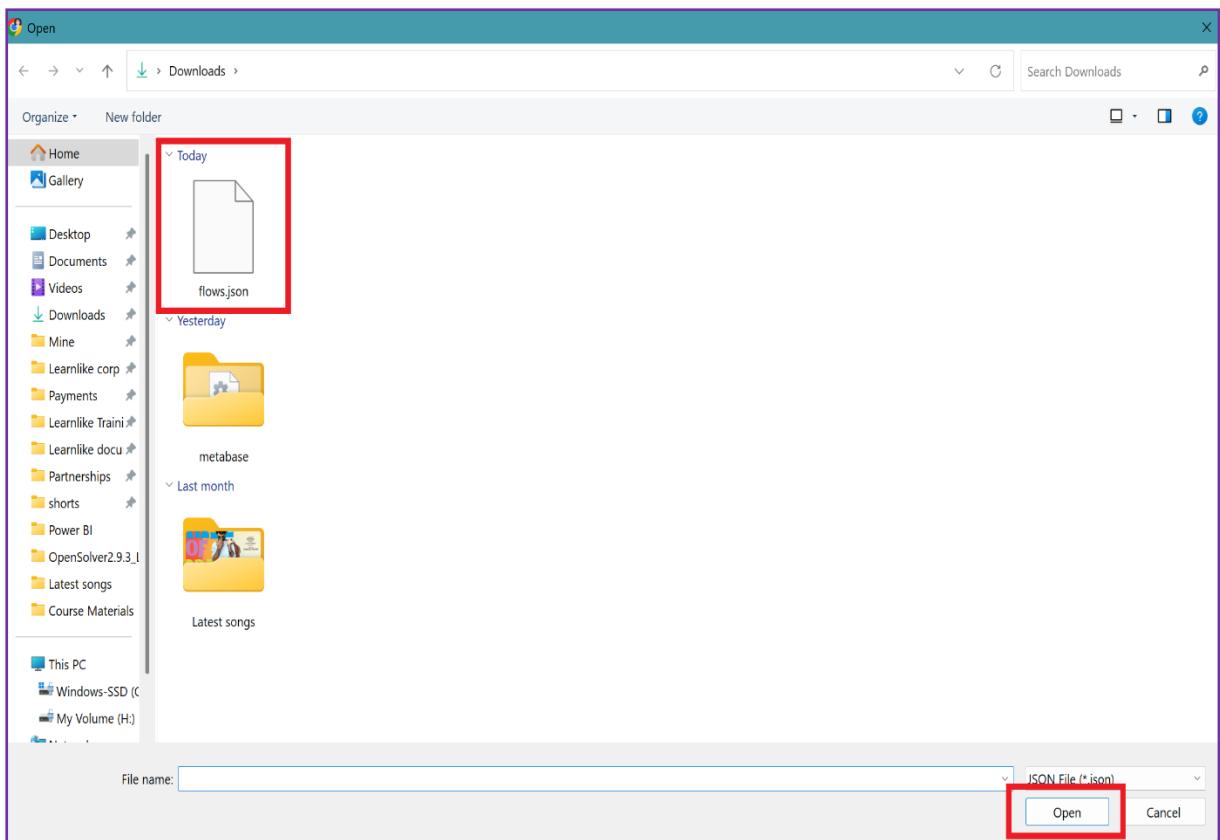
Import to

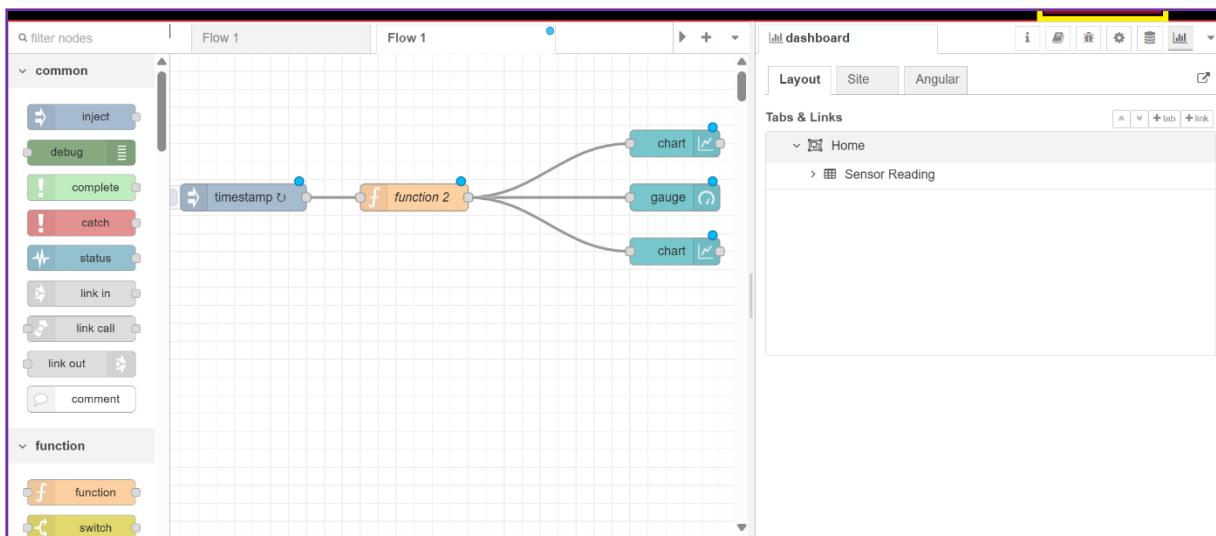
current flow

new flow

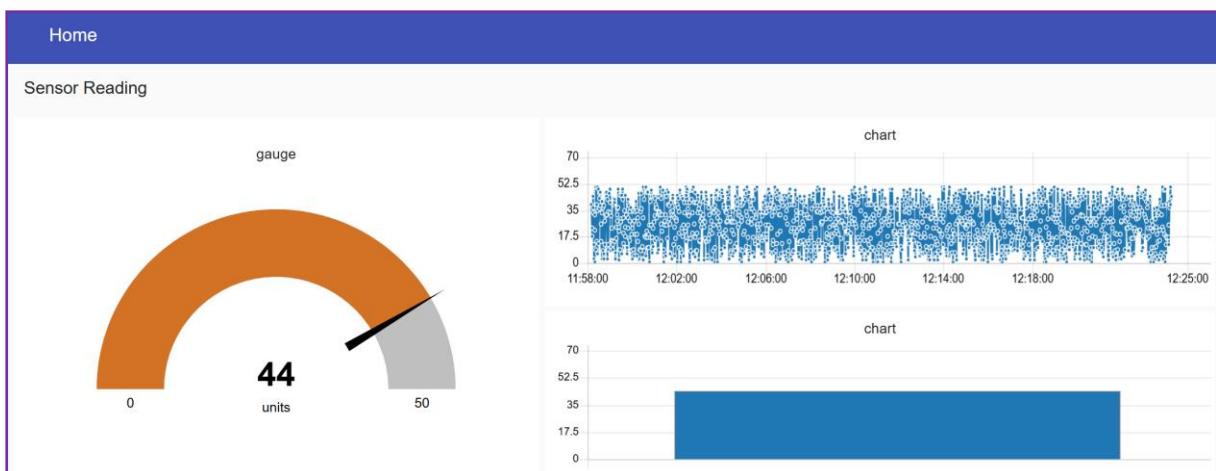
Cancel

Import

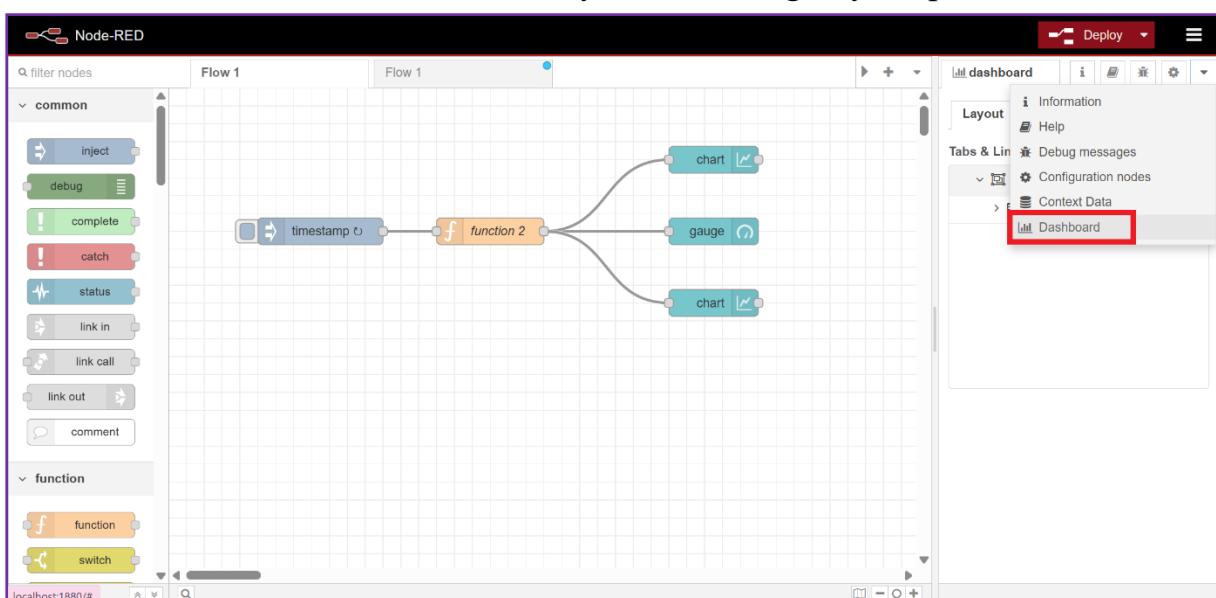




6. To access the UI in your browser, type <http://localhost:1880/ui>.



7. You can customize the dashboard layout according to your preference.



8. Visit the **Node-RED Tutorials** YouTube channel page for step-by-step guides.

<https://www.youtube.com/playlist?list=PLyNBB9VCLmo1hyO-4fIz08gqFcXBkHy-6>

9. You can access the **Node-RED User Guide** at the official website:

[Node-RED User Guide](#)

This guide covers installation, flow creation, nodes, dashboards, and advanced features.